patients, preoperative radiotherapy appears to be a good option for breast conserving therapy.

OC-0392

Tumour characteristics associated with local relapse after hypofractionated radiotherapy in early breast cancer

N. Somaiah[1], D. Rodrigues[2], M. Cheang[3], A. Heindl[2], F. Daley[4], S. Boyle[5], E. Rakha[6], R. A'Hern[3], J. Bliss[7], Y. Yuan[2], J. Yarnold[5]
[1]*The Institute of Cancer Research, Division of Radiotherapy & Imaging and Division of Cancer Biology, London, United Kingdom*
[2]*The Institute of Cancer Research, Division of Molecular Pathology Centre for Evolution and Cancer, London, United Kingdom*
[3]*The Institute of Cancer Research, Division of Clinical Studies Clinical Trials & Statistics Unit, London, United Kingdom*
[4]*The Institute of Cancer Research, Division of Breast Cancer Research, London, United Kingdom*
[5]*The Institute of Cancer Research, Division of Radiotherapy & Imaging, London, United Kingdom*
[6]*University of Nottingham, Department of Histopathology, Nottingham, United Kingdom*
[7]*The Institute of Cancer Research, Clinical Trials and Statistics Unit, London, United Kingdom*

Purpose/Objective: There is a strong inverse association between the proliferation indices of early- and late-responding normal tissues and their sensitivity to radiotherapy fraction size. The aim of this study is to test for association between Ki67 index and the fractionation sensitivity of breast cancer. The hypothesis is that tumours with high Ki67 indices are relatively insensitive to fraction size and over-represented in tumours relapsing after hypofractionated radiotherapy.
Materials and Methods: Between 1986 and 2003, the START-P and START-A trials each tested 2 test dose levels of a 13-fraction regimen (3.0 vs 3.3 Gy & 3.0 vs 3.2 Gy fractions, respectively) in 5 weeks against 25 fractions of 2.0 Gy following primary surgery for early breast cancer. Primary tumour blocks of patients with local tumour relapse were collected for immunohistochemistry (IHC) for Ki67, HER2, ER, PR, CK5/6, EGFR, Geminin, Cyclin A, ATM, BRCA, PTEN and p53. A novel image-processing algorithm was developed to enable in silico alignment of serial tumor sections on a pixel-level and subsequent automated Ki67 scoring. For the initial Ki67 assessment all relapsed patients in the test arms were grouped together.
Results: From a total of 3646 patients entered into the START-P & -A trials, 261 local tumour relapses were recorded at a median follow up of 8.4 years (range 0.9-17.5) and 7.2 years (range 0.7-11.9), respectively. Blocks from 213 patients were recovered, of which 181 were evaluable by IHC. There was no significant difference in proliferation between tumours relapsing after conventional and hypofractionated radiotherapy, with mean Ki67 scores of 7.63 (95%CI: 5.06-11.5) and 5.33 (95CI%: 3.86-7.35), respectively. There was a positive correlation between Ki67 and Geminin scores (r=0.43, 95%CI 0.30-0.54, p<0.0001). The ongoing automated Ki67 scoring done in 41 patients so far has shown a high degree of correlation with manual scoring (r=0.76, 95%CI 0.60-0.6, p<0.0001). Based on unsupervised hierarchical clustering analysisof biomarker expression (binarised data) patients were grouped mainly intoER/PR+, CK5/6 & EGFR+ and Ki67 high expressors, recapitulating known breastcancer subtypes. However, based on this 12-biomarker profile, a subgroup of patients enriched for recurrences in the different dose fractionation schedules cannot be identified.
Conclusions: An association between proliferative indices and fractionation sensitivity in breast tumours has not been demonstrated in the 2 trials analysed together, and adjusted analyses of any imbalances in tumour characteristics between trials will be presented.

Symposium: Advanced technology assessment: Economic evaluation of radiotherapy: Different approaches converging to a same answer?

SP-0393

The costs and benefits of radiotherapy: using treatment fractions to estimate radiotherapy costs and effects

M. Barton[1]
[1]*Ingham Institute for Applied Medical Research, Radiation Oncology, Liverpool NSW, Australia*

Radiotherapy is an essential part of cancer care. Successive studies have shown radiotherapy to be inexpensive and cost-effective. These studies are difficult to undertake and may not be applicable in different countries because of variations in work practices, wages and capital costs. A population-based model of radiotherapy demand and benefits could provide an estimate cost effectiveness if it was coupled to cost data. It could be updated simply by adding new cost or epidemiological data.
We have developed a model of every indication for radiotherapy that has allowed us to estimate that 48% of cancer cases in a Australian require radiotherapy at least once (http://tinyurl.com/pwkua34). It is possible to adapt the model to other countries by substituting the relevant proportions of cancer types and even stages for that country. The model has been expanded to estimate the number of fractions per indication and thus an average of 18 fractions is needed per course. We have also estimated the survival and local control benefit of radiotherapy at 5 years by tumour type. Using Markov modelling it is possible to calculate the number of Life Years Gained and thus we can calculate a survival benefit per fraction. By costing fractions in different countries it will be possible to estimate the cost per life year gained.

SP-0394

Cost-effectiveness of radiotherapy in Europe: a uniform solution for a heterogeneous context?

Y. Lievens[1]
[1]*University Hospital Ghent, Department of Radiation Oncology, Gent, Belgium*

Europe is characterized by its highly heterogeneous landscape with different cultures, traditions and languages. In the context of cancer care as well, large differences are observed in cancer incidence and survival, in economic aspects and available resources, in organization and funding of health care. Cost accounting and economic evaluation models should be developed that allow grasping this heterogeneity.
The ESTRO Health Economics in Radiation Oncology (HERO) project wants to provide a blueprint of the European radiotherapy landscape from an economical perspective. The aim is to support the individual European countries and their national radiotherapy societies in developing and sustaining an optimal radiotherapy service, in line with evidence-based